

**What is claimed is:**

1. A method for optimizing enzymatic resolution of a racemic mixture using a synthesizer, an analyzer and a computer, the method including the steps of:

identifying variables which affect enzymatic resolution;

5 choosing a finite number of experimental tests, wherein the experimental tests have values for the variables;

providing a plurality of wells;

assigning each of the experimental tests to a particular well;

10 dispensing reagents and solvents into a plurality of wells chosen from the values for the experimental tests;

enzymatically resolving in the synthesizer using operating conditions chosen from the values for the experimental tests;

obtaining at least a portion of contents from the plurality of wells;

15 analyzing to determine the magnitude of enzymatic resolution for the at least a portion of the contents from the plurality of wells;

automatically generating a statistical analysis using the computer based on the step of determining the magnitude of enzymatic resolution and at least one of the variables identified in order to evaluate the enzymatic resolution in the wells; and

20 automatically generating, using the computer, suggested parameters for future experiments based on the statistical analysis.

2. The method of claim 1, wherein one of the variables is type of enzymes.

3. The method of claim 2, wherein the variable for the type of enzymes is fixed.

25 4. The method of claim 1, wherein one of the variables is type of solvents.

5. The method of claim 4, wherein the solvents are selected from the group consisting of MeCN, MeOH, EtOH, DMF, H<sub>2</sub>O, aqueous buffers and mixtures thereof

6. The method of claim 1, wherein one of the variables is pH.

7. The method of claim 1, wherein one of the variables is type of substrates.

5 8. The method of claim 1, wherein the step of analyzing to determine the magnitude of enzymatic resolution includes determining optical rotation of the at least a portion of the contents from the plurality of wells.

9. The method of claim 8, wherein the analyzer is a polarimeter.

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10. The method of claim 8, wherein the analyzer is a chiral HPLC.

11. A method for selecting an optimal enzyme for carryout out an enzymatic transformation of a compound using a synthesizer, an analyzer and a computer, the method including the steps of:

identifying variables which affect enzymatic catalytic activity;

choosing a finite number of experimental tests, wherein the experimental tests have values for the variables;

providing a plurality of wells;

assigning each of the experimental tests to a particular well;

dispensing reagents and solvents into a plurality of wells chosen from the values for the experimental tests;

enzymatically transforming the compound in the synthesizer using operating conditions chosen from the values for the experimental tests;

25 obtaining at least a portion of contents from the plurality of wells;

analyzing to determine the magnitude of enzymatic transformation for the at least a portion of the contents from the plurality of wells;

automatically generating a statistical analysis using the computer based on the step of determining the magnitude of enzymatic transformation and at least one of the variables identified

30 in order to evaluate the enzymatic transformation in the wells; and

automatically generating, using the computer, suggested parameters for future experiments based on the statistical analysis.

12. The method of claim 11, wherein one of the variables is type of enzymes.

13. The method of claim 11, wherein one of the variables is amount of enzyme.

14. The method of claim 11, wherein carrying out of the enzymatic transformation of a compound is the enzymatic resolution of a racemic mixture.

15. The method of claim 11, wherein the enzymatic transformation is a chemical transformation of a compound.

16. The method as claimed in claim 11, wherein the step of analyzing the samples using the analyzer includes determining the amount of product yield.

17. The method as claimed in claim 11, wherein the step of analyzing the samples using the analyzer includes determining the amount of unreacted compound.

18. The method as claimed in claim 11, wherein the step of automatically generating a statistical analysis includes ranking the plurality of wells based on the magnitude of enzymatic transformation.

19. The method as claimed in claim 11, wherein the step of automatically generating a statistical analysis includes determining a most favorable reaction in one of the plurality of wells based on the magnitude of enzymatic transformation.